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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,408	10/28/2003	Venkat Rangan	112-0122US	5639

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EXAMINER	
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ART UNIT	PAPER NUMBER
2182	

DATE MAILED: 01/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/695,408	RANGAN ET AL.	
	Examiner	Art Unit	
	Scott Sun	2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/2/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 10/31/05 have been fully considered but they are not persuasive.

2. Examiner summarizes applicant's arguments as:

a. Regarding claim 1, Yamamoto does not teach a switch, a control module, or data migration.

b. Regarding claim 2, Yamamoto does not teach table information.

c. Regarding claim 3, Yamamoto does not teach barrier entry or delay of write operations.

d. Regarding claims 10 and 19, Yamamoto does not teach a switch coupling a host and a storage system.

e. Applicant's arguments with respect to claims 4-9, 13-18, 22-27, and 31-36 have been considered but are moot in view of the new ground(s) of rejection.

3. Examiner's response to applicant's arguments:

4. Regarding applicant's arguments for claim 1, and specifically regarding a "switch", examiner asserts that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). According to the detailed disclosure and applicant's arguments, it appears that applicant intends to use "switch" to mean "a crossbar switch" (applicant's arguments, page 9) and argues that an

arbiter is not a switch. However, claim 1 merely recites a "switch" which means "a device or programming technique for making a selection" (IEEE dictionary, 7th edition, relevant pages attached). Arbitration is defined as "the process of selecting the next bus master" and also as "the process of determining which requesting device will gain access to a resource", both would require a selection is being made. **Based on the above definitions, the connecting facility disclosed by Yamamoto is a switch as it arbitrates communicative access between interface adapters, drive interface adapters, and cache memory.**

Further regarding claim 1, and specifically regarding a "control module", applicant argues that Yamamoto does not teach a control module. To help the applicant better understand examiner's prior rejection, paragraphs 20-23 describe figure 1, which include a terminal interface (administrator, element 43) that is a control module.

Further regarding claim 1, and specifically regarding "data migration", examiner asserts that Yamamoto's teachings are directed toward data transfers in a storage system (33, 34, figure 1). If applicant intends to mean a specific type of data migration such as copying data from one storage location to another storage location as show in applicant's disclosure, examiner again asserts that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims.

5. Regarding claim 2, and specifically regarding table information, examiner asserts that Yamamoto's system utilizes logical volumes that are mapped into physical storage space (paragraph 29). Yamamoto explicitly discloses tables (figures 5 and 6) describing the logical volumes including mapping to the physical storage space

(paragraph 43). Because the common file system block (element 73) and logical volume access blocks (element 82) perform the mapping (paragraph 29), these elements are the table information. Note both the common file system block and the logical volume access block are part of the port processor (adapter shown in figure 3). Furthermore, Yamamoto explicitly discloses that the control module (terminal interface in figure 1) is being used for maintaining table information by a system administrator (paragraph 43).

6. Regarding claim 3, and specifically regarding barrier entry and delay of write operations, examiner asserts that the lock operation referenced in prior rejection is a barrier entry. Yamamoto teaches explicitly that access to a file is delayed (pending) if another access previously requested a lock (paragraph 39). Because access includes write requests, it would be delayed by the lock mechanism. Note that the lock manager resides in the port processor (adapter in figure 3).

7. Claims 10-12, 19-21, and 28-30 are substantially similar to the claims 1-3 above. Therefore the same arguments are applied.

8. Further regarding claims 10 and 19, examiner directs applicant to figure 1 in which a switch (bus structure, element 16) is shown connecting the host system and the storage system.

9. Having addressed each of applicant's arguments, examiner maintains the prior rejection regarding claims 1-3, 10-12, 19-21, and 28-30 attached below. New grounds of rejection are made in accordance with the amendments made to claims 4-9, 13-18, 22-27, and 31-36.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 10-12, 19-21, 28-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamamoto (US PUB 2002/0152339 A1).

3. As per claim 1, Yamamoto discloses a storage processing device (system in figure 1), comprising an input/out module (adapters and connecting facility) including:

Port processors (adapters) to receive and transmit network traffic (paragraph 22);

And a switch (connecting facility) coupling said port processors (paragraph 23);

And a control module (terminal interface) coupled to said input/output module, said input/output module and said control module being configured to interactively support data migration (paragraph 21).

4. As per claim 2, Yamamoto discloses the storage processing device of claim 1, wherein said port processors include table information (common file system block and

volume access block, figure 3, 5 and 6) related to data migration and wherein said control module is coupled to said table information to maintain said table information for data migration (paragraph 43).

5. As per claim 3, Yamamoto discloses the storage processing device of claim 2, wherein said table information includes a barrier entry (lock manager) and said port processors delay data write operations if said barrier entry relates to said data write operation (paragraph 29, 39).

6. Claims 10-12, 19-21, and 28-30 are substantially similar to the claims 1-3 above. Therefore the same arguments are applied. A further note is made regarding claims 10 and 19, the limitation of "at least one host and at least two storage devices" is also disclosed by Yamamoto (paragraph 17).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 4, 5, 13, 14, 22, 23, 31, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto in view of Sexton et al (PG Pub # 2003/0221022).

9. Regarding claim 4, Yamamoto discloses claim 2, but does not disclose explicitly an entry defining an extent operation type. However, Sexton discloses table information (migration state structure 200, figure 2) including an entry (object stack 201) related to

the extents in the data migration (paragraph 43), said entry defining an extent operation type (paragraph 49). Examiner notes that Sexton discloses object stack 201 is initialized to appropriate values that controls driver to perform a particular operation, therefore the object stack defines operation type.

Teachings of Yamamoto and Sexton are from the same field of computer systems and more in particularly the field of storage management. Therefore it would have been obvious for a person of ordinary skill in the art at the time of invention to combine teachings of Yamamoto and Sexton by using the tables disclosed by Sexton in the system disclosed by Yamamoto for the benefit of simplifying data migration (Sexton, paragraph 13).

10. Regarding claim 5, Sexton further discloses the storage processing device of claim 4, wherein said table information further includes a legend entry (action table 219, paragraph 2) for each extent operation type defining migration operation for the extent (paragraph 50).

11. Claims 13, 14, 22, 23, 31, 32 are substantially similar to claims 4 and 5. Therefore the same arguments are applied.

12. Claims 6-9, 15-18, 24-27, 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto in view of Sexton and further in view of Bridge (US Patent #6,880,102).

13. Regarding claim 6, Yamamoto and Sexton combined disclose claim 5, but does not disclose explicitly entries defining physical extent location. However, Bridge

discloses entries (pointers to extents) defining physical extent location (column 23, lines 45-54). Examiner notes that the extents are locations on the disk drives (column 10, lines 40-44). Therefore the pointers imply physical location. Also see figure 9 for a more detailed description of the process for moving extents between disks.

14. Teachings of Yamamoto, Sexton, and Bridge are from same field of storage management. Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to combine teachings of Yamamoto, Sexton, and further with teachings of Bridge by using pointers and extent relocation operation taught by Bridge in the combined system of Yamamoto and Sexton for the benefit preserving concurrency and data access during data migration (column 8, lines 50-59).

15. Regarding claim 7, Bridge discloses claim 6, and further discloses entries indicating a barrier entry (lock) for data being migrated (column 8, lines 61-62). Examiner asserts that a person of ordinary skill in the art would readily recognize that entries indicating data not migrated and data migrated are used to track progress of data migration.

16. Regarding claim 8, Bridge discloses claim 7, and further discloses delay data write operations if said barrier entry relates to said data write operation (column 8, lines 61-62; column 23, lines 60-63).

17. Regarding claim 9, Bridge discloses claim 8, and further discloses commands to copy data and places said barrier entry for said data being copied (column 8, lines 61-62).

18. Claims 15-18, 24-27, 33-36 are substantially similar to claims 6-9. Therefore the same arguments are applied.

Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Sun whose telephone number is (571) 272-2675. The examiner can normally be reached on M-F, 10:30am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim N. Huynh can be reached on (571) 272-4147. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SS
1/5/2006

KIM HUYNH
SUPERVISORY PATENT EXAMINER
1/6/06